

TROPICAL STORM LEX (24W)

Tropical Storm Lex was the first of three significant tropical cyclones to develop in the month of December. Initially, Lex developed rapidly in the wake of Super Typhoon Kim (23W) and presented a threat to Guam. Significant further development was inhibited by Kim (23W) and a mid-latitude trough, although a brief flare-up of convection occurred just before Lex passed through the southern Marianas.

Lex first appeared as a small mass of convection about 300 nm (556 km) to the east-southeast of the Kwajalein Atoll in the Marshall Islands at 301200Z November. The convection rapidly increased. Upper-level organization and low-level inflow also increased over the next 18-hours. For these reasons, Lex was initially placed on the Significant Tropical Weather Advisory (ABPW PGIW) at 010600Z December.

The tropical disturbance continued to show potential for development and at 022345Z, it became the subject of a Tropical Cyclone Formation Alert (TCFA). The convection became more centralized, prompting JTWC to issue the first warning on Tropical Depression 24W at 031800Z. Upper-level organization continued to improve, as satellite imagery indicated good banding features to the north and south. Increased satellite (Dvorak) intensity estimates resulted in an upgrade from Tropical Depression 24W to Tropical Storm Lex at 040000Z on the second

warning.

Lex was first fixed by aircraft reconnaissance at 040537Z. The Aerial Reconnaissance Weather Officer reported surface winds of near 45 kt (23 m/sec), and fixed the surface center further to the east of the previous (040000Z) warning position, which was based on satellite data, and 85 nm (157 km) east of the 040600Z forecast position. This led JTWC to relocate Lex's position on the 040600Z warning.

Although forecast to reach typhoon intensity within 48-hours, it had already attained its peak intensity by 040600Z. The combination of an eastward moving trough and the proximity of Kim (23W) to the northwest, greatly inhibited Lex's upper-level outflow.

Aircraft reconnaissance indicated a tilt toward the west between the surface center and the upper-level center and a possible secondary center about 30 nm (56 km) to the northwest of Lex. As evidenced in visual satellite imagery at 042344Z (Figure 3-24-1), Guam was between Super Typhoon Kim (23W) (to the northwest) and Tropical Storm Lex. Lex continued to decrease in convection and organization. A nighttime aircraft reconnaissance fix mission scheduled for 051200Z found 700 mb westerlies throughout the area and no sign of a closed circulation. For these reasons, Tropical Storm Lex

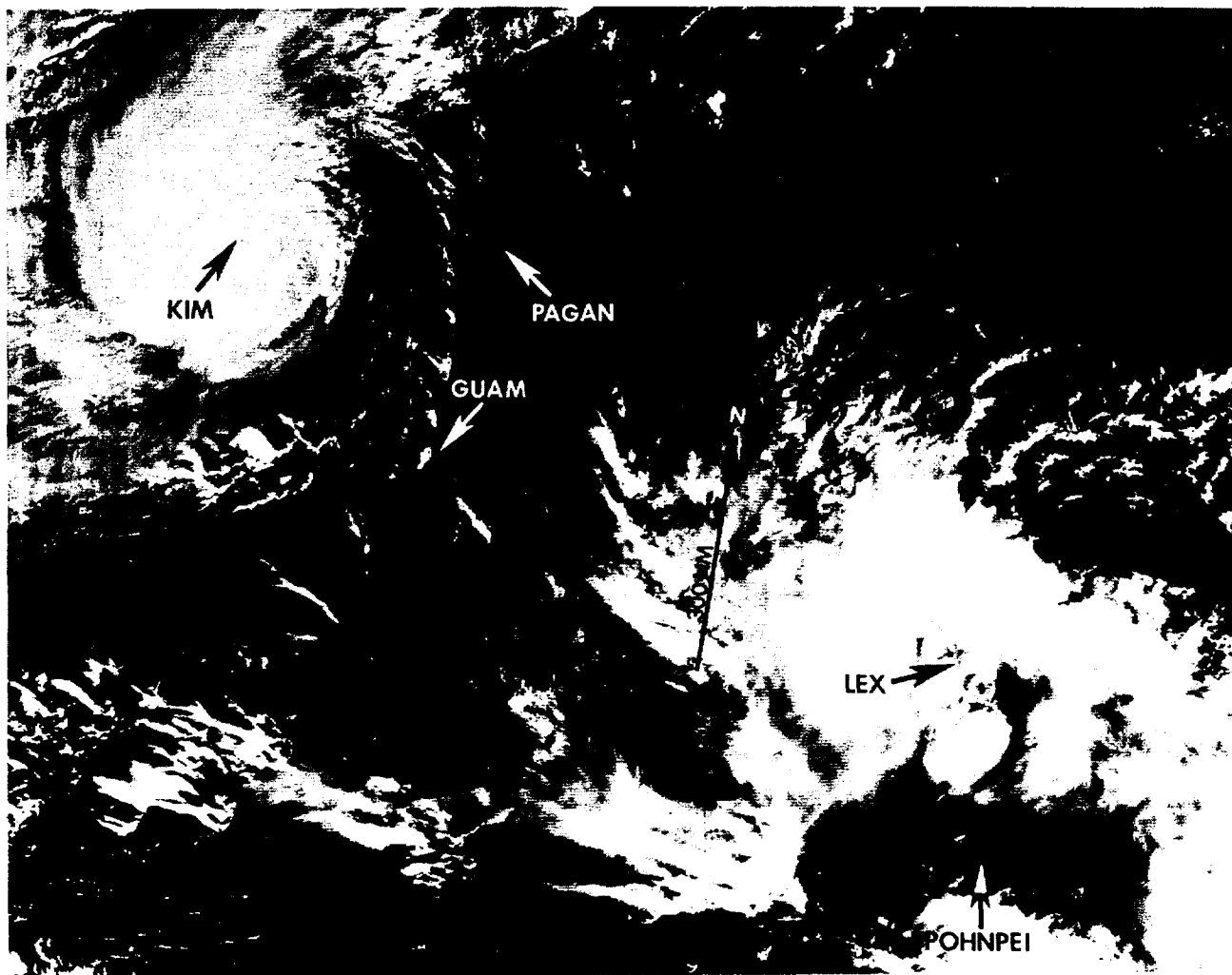


Figure 3-24-1. Visual satellite imagery showing Super Typhoon Kim (23W) and Tropical Storm Lex. The island of Guam is in the region between the two tropical cyclones (042344Z December DMSP visual imagery).

was downgraded to Tropical Depression 24W, and the final warning (number 8) was issued at 051200Z.

JTWC continued to monitor the remnants of Lex. Because of the sudden flare-up of central cold cover (Dvorak, 1984) cloud viewed on the satellite infrared imagery (Figure 3-24-2), Lex again was the subject of a TCFA (062300Z) about 80 nm (148 km) east-southeast of Guam. Due to the proximity to Guam, the prospect of sudden deepening and the uncertainty concerning what was really out there, JTWC diverted a WC-130 aircraft from a fix mission, that was in progress on Kim (23W), to fly an investigative profile on Lex.

The results were that Lex's low-level circulation could not be closed off and warnings were not resumed. The weak disturbance moved rapidly by at 28 kt (52 km/hr) and passed directly over the island of Rota located 40 nm (74 km) north-northeast of Guam. Mid- to upper-level shear over the system was strong and the upper-level outflow remained restricted by Super Typhoon Kim (23W). JTWC cancelled the TCFA at 071500Z. The remains of Lex then moved northwestward until 080000Z, then curved northeastward and transitioned to an extratropical system.

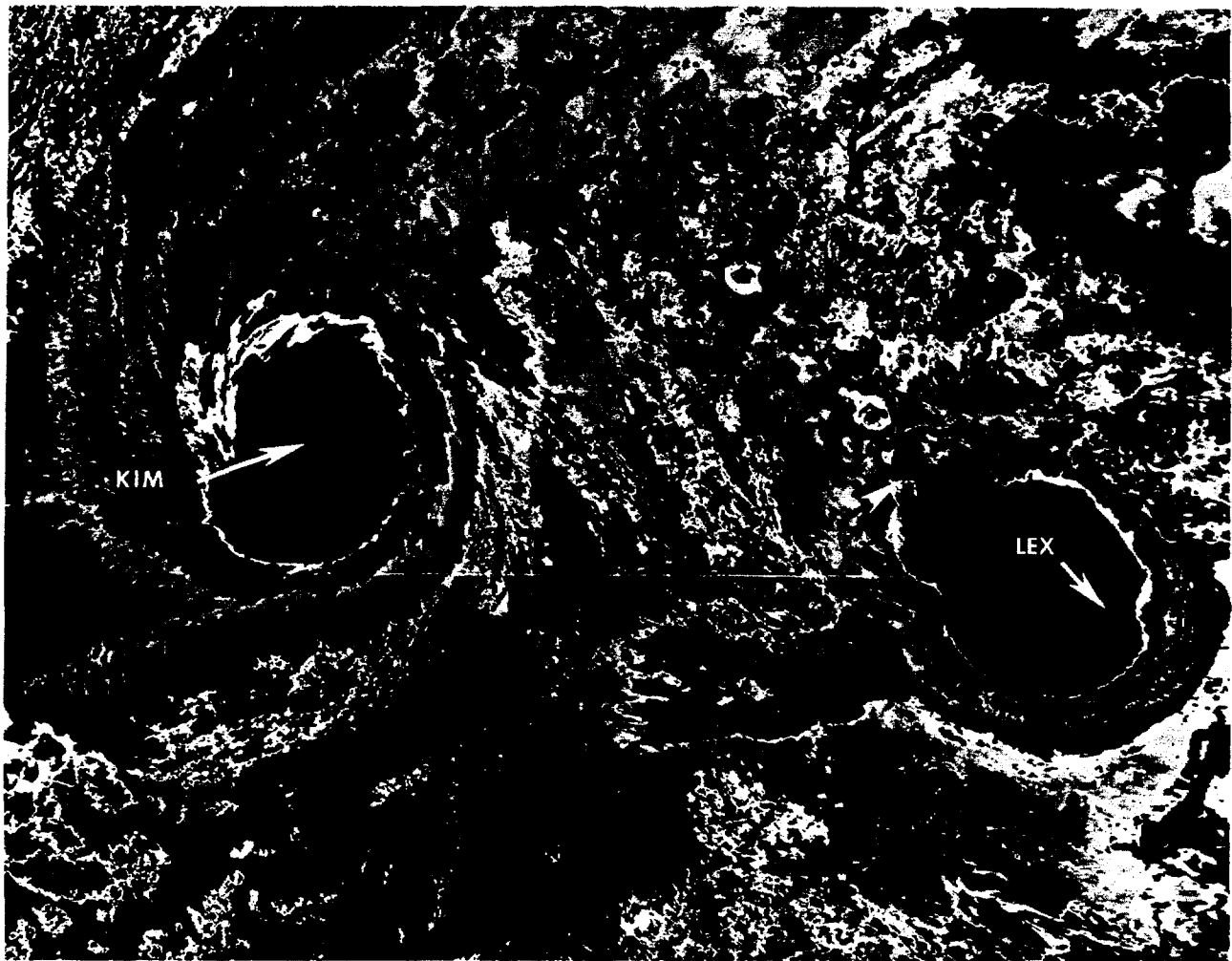


Figure 3-24-2. Enhanced infrared image for the Dvorak intensity estimation technique of the disturbance (Lex) and Kim (23W) at typhoon intensity. At first glance, the cloud signatures look similar. However, the distinction between the transitory flare-up of the central cold cover (Dvorak, 1984) over Lex and the persistent central dense overcast and eye of Kim (23W) is crucial for proper intensity analysis (061758Z December NOAA infrared imagery).